MobilAlarm

Validating European Mobile Alarm Services
for Inclusion and Independent Living

1 March 2004 – 31 August 2005

Final Report

31 August 2005

Summary

Within the *MobilAlarm* project which was supported by the European Commission from March 2004 until August 2005, a location-independent emergency service for older, chronically ill and disabled people was tested and evaluated. The consortium included six organisations from Germany, the United Kingdom and Spain. The involvement of end users and the opportunity to use their feedback for improving the service was a unique characteristic of the project. The core feature of the *MobilAlarm* service is an emergency call from a mobile device to a professional response centre, using the GSM network for voice communication and GPS technology for determining the location of the user. The tests revealed that the device and service are suitable for market introduction and that there is a large potential market for such an easy to handle emergency unit. Remaining at the forefront of developments in locating technology will be an important issue for updates of the service.

1 Introduction: the *MobilAlarm* project and its partners

Consortium partners

MobilAlarm (http://www.*MobilAlarm*-eu.org) was a market validation project supported by the European Commission in the framework of the eTEN (electronic Trans-European Networks) programme from March 2004 until August 2005. The project consortium has been testing and evaluating an innovative location-independent alarm service for older, chronically ill and disabled people and for all those concerned about their safety while outside. The project consortium included six partners, among them three service centres, in three countries:

empirica Gesellschaft für Kommunikations- und Technologieforschung mbH (Bonn, Germany), project co-ordinator, specialised in European ICT projects,

Attendo Systems GmbH (Ismaning, Germany), a supplier of home alarm systems and nurse call systems providing the device and the service centre software for the project,

Telehealth S.L. (Valencia, Spain), a manufacturer and service provider in the field of e-health,

Fundación Andaluza de Servicios Sociales (FASS, Seville, Spain), a public social service provider including tele-assistance for more than 30,000 users in Andalusia.

Attendo Response Ltd. (Rotherham, UK), providing response services for more than 40,000 clients, most of them old people, in various regions of the UK,

Recontrol (Karlsruhe, Germany), a private response centre operator with 3,000 people connected and a focus on serving charities' clients,

Further project participants

Apart from the formal consortium, several partners were involved informally, for example user organisations such as Help the Aged in the UK and the Parkinson Self-Help Group Germany as well as Pansonic, the device manufacturer. Therefore the project represented the whole value chain of a mobile emergency service. The involvement of end users and the opportunity to use their feedback and requirements for improving the service has been a unique feature of *MobilAlarm*.

2 Objectives and target groups

Objectives

The overriding objective of *MobilAlarm* was to test and evaluate the technical, organisational and economic characteristics of this tele-assistance service and to prepare its accelerated roll-out in Member States. The mobile service promises many benefits for its prospective clients: greater feeling of security, self-confidence and independence, faster service delivery in urgent cases, thus leading to improved quality of life.

Target groups

The *MobilAlarm* service may be of interest to numerous people which can be subdivided into four large groups considering their physical capabilities and social situation:

- Older people who are neither disabled nor chronically ill but who already have some health limitations and are thus anxious of having an accident or of developing a severe health condition while outside. Some of them may already have experienced an accident, others may be afraid of it.
- Disabled and chronically ill people who need immediate help when their physical condition does not allow self-help: patients suffering from Parkinson, Multiple Sclerosis, diabetes, epilepsy and others.[1]
- Users unable to find home or to respond when they got lost and need to be located. This includes travellers who lost their way and also people suffering from dementia. In the future, infants may also be included in this group.
- People in a normal physical condition who are threatened by violence: Potential victims of domestic violence including predominantly women, people out alone at night or in insecure locations, witnesses of crime threatened by the accused. Lone workers such as

[1] For figures on the number of people with heart diseases see Rayner, Mike; Petersen, Sophie (2000): European cardiovascular disease statistics, 2000 edition. British Heart Foundation Health Promotion Research Group, Department of Public Health, University of Oxford. (www.dphpc.ox.ac.uk/bhfhprg).

nurses on home care attendance, gas station workers and maintenance staff in large industrial sites can also be included here.

- People at risk of accidents, for example those doing risk sports and again lone workers.

To give just one brief example, the service may be very helpful for people suffering from the Parkinson disease. They may experience sudden emergencies: loss of control of limbs, dizziness, pain, panic and downfalls that may cause broken limbs. The *MobilAlarm* service is able to guide help to them and meanwhile provide a familiar person to talk with.

Key trend: ageing population

From a business point of view the key trend relevant for the first three of the four *MobilAlarm* target groups is the ageing of the European society. The share of people over 64 has been increasing rapidly (1960: 10.6% of total population; 2000: 16%) and will continue to increase (2050: 28%). An ageing population will need considerably more informal carers and home care solutions if health and care systems are to remain sustainable. This is particularly true in view of the fact that the fastest growing population segment is those 80 years and older.[2] Looking at those older people who suffer from at least one of the major, most prevalent chronic diseases, there is an estimated number of more than 70 million people in Europe.[3] Thus, even if only a small fragment of these people was interested to pay for a mobile alarm service, the market potential is huge.

3 Methodology: three-stage test and evaluation phase

Test sequence

The *MobilAlarm* service has been tested in three phases: an internal test with personnel of the service centres involved in the project, a pilot test with a few “real” users, and a large-scale test with more than 100 users in Germany, the UK and Spain. Technical, organisational and evaluative adjustments took place after each phase in order to ensure a reliable service and an insightful evaluation. All tests followed a defined schedule and were empirically validated.

Interview process

Open-ended questionnaires were designed for semi-structured interviews with test users, service centre staff and decision makers in organisations which may be future customers of the service. Users from various target groups and age classes were involved. They were interviewed prior to the tests and afterwards in order to gain insights on their requirements and opinions about the device and service. Selected users met for a group discussion to exchange experiences. Founding the mobile alarm service on an empirical basis will be a unique source of knowledge giving a lead over competitors.

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[2] See Eurostat; European Commission (2001): The social situation in the European Union 2000, Brussels, p. 46. See also England, Robert S. (2001): The Fiscal Challenge of an Aging Industrial World. A White Paper on Demographics and Medical Technology. Washington, DC: Center for Strategic and International Studies - Global Aging Initiative, p. 73.

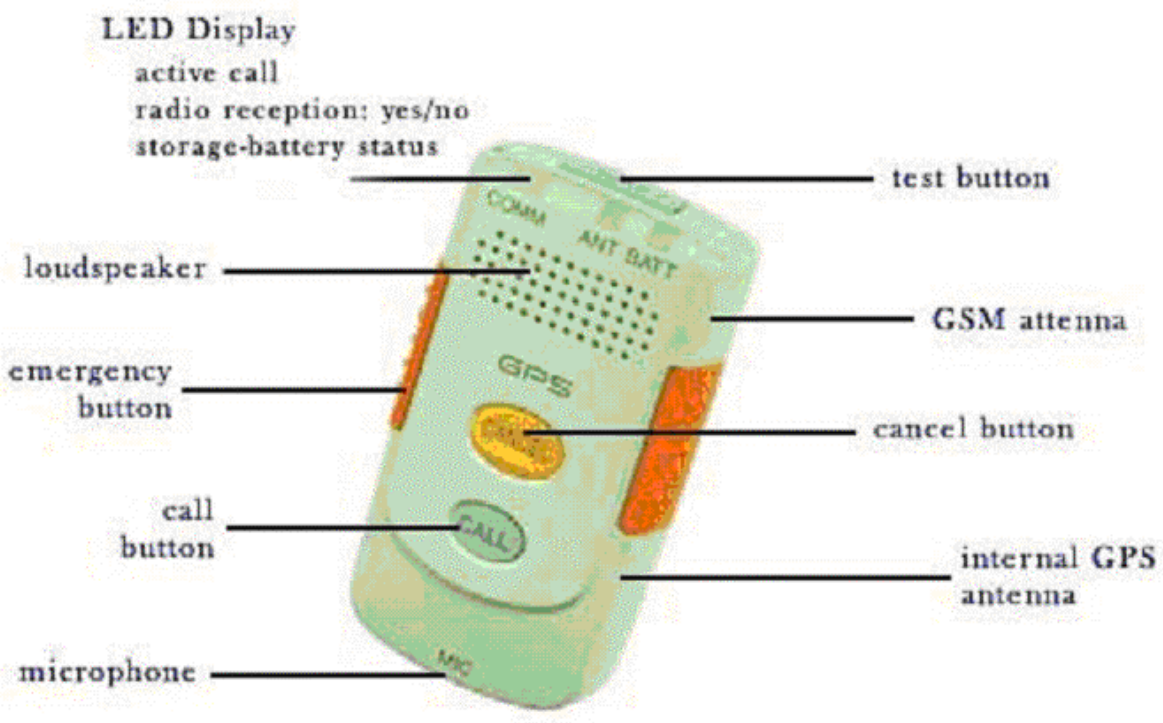
[3] SeniorWatch (2002): Older people and Information Society Technology. A comparative analysis of the current situation in the European Union and of future trends. Deliverable No. 5.1. (http:/www.seniorwatch.org).

4 Technology description: the *MobilAlarm* unit and service centres

The *MobilAlarm* device

The *MobilAlarm* device has been specifically designed for being used in situations of distress: First of all it is very easy to handle because it has only five buttons, two of them the lateral alarm buttons that have to be pressed simultaneously for one second to trigger an alarm. This functionality allows to activate emergency calls just by grasping the device and simultaneously pressing the emergency keys with no need to search for a certain button, let alone dial an emergency number. The two-button solution was favoured particularly by the people suffering from the Parkinson disease. In case the customer does not need professional help, he or she can use the call button to establish a normal telephone connection to a pre-defined number, for example to a relative or to a service centre that can connect to any number required. Secondly, the device is slightly smaller than a common mobile phone and its weight is only 100 gram; thus it is easy to carry and can even be worn at a lace around the neck if required. The unit has a long battery life of up to six days in stand-by mode. Light-emitting diodes at the top show the status of GSM network availability and battery load. Figure 1 shows the device as it was used in the tests. The updated device will look similar but more refined.

FIGURE 1: OVERVIEW OF THE *MOBILALARM* DEVICE COMPONENTS



Source: MobilAlarm

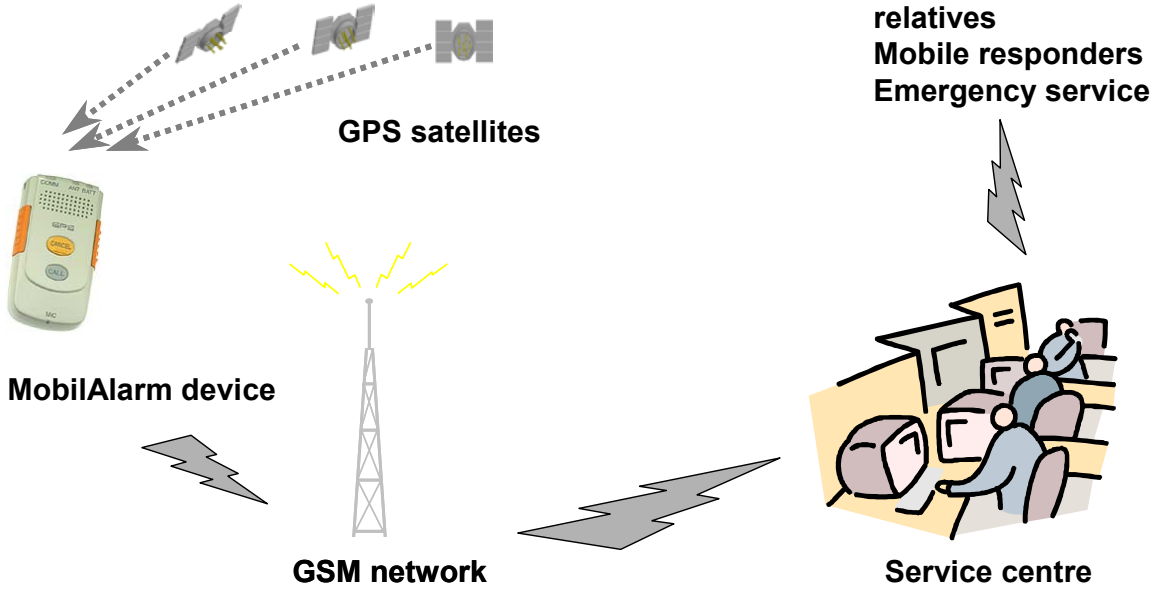
The *MobilAlarm* service

On pressing the alarm buttons of the device, a voice connection to a professional service centre is established. A customer file opens automatically on the operator's screen when he or she takes the call so that he knows who is calling even before he talks to the person in

need. On demand from the service centre, the device transmits location data by using the Global Positioning System (GPS) satellites. The position data are transmitted by Attendo's Care Phone Protocol through the voice channel. This protocol is a unique selling point compared to competitors' mobile emergency devices that transmit location data with unreliable Short Message Service (SMS). Emergency service centres can be offered to use separate servers with prioritised SMS, but even then the network providers cannot ensure an immediate delivery.

In the service centre, the user's position is indicated on an electronic map on the operator's screen, allowing to transmit it to emergency personnel or to direct such personnel even if the person in need is not able to describe his or her position. Emergency services can be alerted even across European Union Member State boundaries.

FIGURE 2: OVERVIEW OF THE *MOBILALARM* SERVICE SEQUENCE



Source: MobilAlarm

5 Developments

Technological developments

A current technical challenge is that the locating function cannot work when the device is shielded from a sufficient number of GPS satellites. This may be the case, for example, inside buildings, in urban "building canyons" and in dense forests, particularly when it is raining. Project research showed that Assisted GPS (A-GPS) will be an interesting feature for the second device generation. By being assisted through the mobile phone network, the device holders can be located even inside buildings and other shielded locations with an accuracy of five meters. An A-GPS Standard called Secure User Plane Location (SUPL) was defined by the Open Mobile Alliance (OMA) in mid 2005. The *MobilAlarm* service will use commercial GPS assisting services based on these standards, which are likely to be available by early 2006.

However, even A-GPS requires some basic satellite signals and will fail in completely shielded locations. This general problem of GPS can in principal be eased by combining it

with GSM locating. However, while the mobile networks allow to determine the GSM cell in which the user is present, the accuracy of this method is severely compromised because GSM cells have a radius of up to several kilometres in the country side. This would make it very difficult and expensive for rescue services to find a person in need. GSM "locating" will only be a meaningful fallback in the future if reasonably precise technology was offered for general market use.

Business developments

The social alarm community is a fairly conservative one. Within and outside of its conventional boundaries, few actors have already attempted to launch a mobile alarm service which includes a location function. Although mature and affordable technology is now becoming available – the *MobilAlarm* consortium identified around ten devices with emergency call and localisation function offered in Europe –, alarm service providers remain hesitant to include mobile solutions into their service range. Traditionally, they operate within a rather non-innovative environment. For example, it took more than 15 years until standard alarms became more widely available in the EU.

So far no successful model of mobile emergency services that could serve the European market is known. Market research reports about mobile alarm services are not available, but interviews with those who have tried to penetrate the market indicate that they have few customers. There are several reasons for this fact: available mobile devices may be too difficult to handle, service prices may be too high, customer requirements are not known well enough and consequently not adequately addressed, customers may require a service that is 100% reliable with regard to mobile phone networks and locating which cannot be fulfilled, and business models may be unripe with regard to pricing, marketing and emergency workflow organisation. All these issues have been addressed in the *MobilAlarm* project.

6 Results: the service is suitable for market introduction

Extended tests with "real" clients were at the core of the *MobilAlarm* project. In autumn 2004, internal technical tests of the device and service were conducted, followed by tests with "real" clients from February to June 2005. The most important findings include the following:

The test persons were generally pleased about the simple functionality of the device. Most testers considered it as a valuable alternative or supplement to conventional mobile phones which are more complicated to operate.

- The emergency call functioned very well and worked even at places where common mobile phones with the same SIM card were not able to establish a network connection. While some test clients were worried about GSM availability in remote places, the majority was aware about GSM gaps through previous experiences with mobile phones.
- The connection to a professional service centre that knows about the customers' personal profile was considered as an advantage of the *MobilAlarm* device over common mobile phones.[4]

[4] This confirms findings of a market study by the Bavarian Academy for Promotion and Marketing in Sullus, Bastian; Loddenkemper, Kai; Albersmeier, Martin; et al. (2004): Analyse der Akzeptanz für das Mobile Care Phone von Attendo Systems. Ein Kooperationsprojekt der Attendo Systems GmbH mit der Bayerischen Akademie für Werbung und Marketing in München. Munich, 22 July 2004.

- The speaking and hearing quality of the *MobilAlarm* device was considered as excellent. The handset has to be held in front of the body like a remote control and not at the ear like a normal mobile phone. No interferences with hearing aid devices was reported.
- The user's location was indicated correctly on the electronic map in the service centre. While the users were impressed about the accuracy of the locating function, some did not realise that locating is not possible inside buildings and in other shielded locations.
- While almost all test users found the device and service useful, many people consider themselves as not old or frail enough to use an emergency device. Thus a thoughtful marketing concept needs to be implemented.

All in all, the tests showed that the technology is suitable for market introduction. This applies to all countries involved. The test findings have already fed back into the manufacturing and service delivery process allowing considerable fine-tuning with regard to user requirements.

7 Business benefits to social service providers and insurance firms

Benefits to social service providers

The *MobilAlarm* service is not only beneficial for final customers but also for social service providers such as charities, housing agencies and other welfare organisations, including private providers of such services. Mobile alarm functions offer the following benefits to them:

- Addressing new target groups – for example younger olds, female joggers and risk-sport practitioners – that do not need social alarm functions at home but while out.
- Expansion of present social alarm services to a wider geographic area, even across national borders, thus improving the quality of services and meeting rising demand for "mobile security".
- Increased opportunities for offering co-operative services with suppliers of related or value-added services.

All in all, location-independent alarm services are expected to increase the competitive position of those service providers which will offer this new service – and develop, in addition, other value-added services.

Similar benefits are expected for those centres that provide centralised telephone and response services 24 hours a day and seven days a week, on behalf of social service providers or for their own clients. Providing an innovative service will improve their position when competing in calls for tenders to deliver service centre services for charities, housing and local authorities, insurance companies and other organisations that may be interested in providing extra services to their clients.

Benefits to public and private insurance funds

Mobile alarm services can reduce the expenditures of health and care insurers. Costs can be saved by providing faster help and by facilitating homecare:

- Mobile alarm services may lead to faster help in case of an emergency situation, allowing emergency personnel to provide help at a time when there is not yet any damage or low damage to the client's health. For example, if an old lady has an accident while walking in a forest in winter, help may be available before frostbites occur.

- Mobile alarm services facilitate homecare as opposed to more expensive residence care and thus can reduce overall care costs.

By decreasing health and care expenditures and also by offering extra benefits to customers, insurers gain competitive advantage over competitors. They could thus be inclined to include a mobile alarm service in particular insurance contracts.

8 Conclusions

The *MobilAlarm* device and service has proved its functionality and is suitable for market introduction. The target markets of older, disabled and chronically ill people offer large business opportunities. They also require a thoughtful and innovative marketing strategy because the target group is differentiated and demanding.

The *MobilAlarm* service offers considerably improved security while out. Two technological limitations remain: gaps in mobile network availability and difficulties to locate people through GPS in shielded locations. In order to enhance the possibility of mobile alarm calls from remote locations, it is technically possible but economically not meaningful for network operators to close the GSM gaps in the countryside. As regards locating, the second device generation will be substantially improved by A-GPS technology. Furthermore, European 112 regulation could foster technological progress as it did in the US. By defining a minimum accuracy while locating a mobile device during a public emergency call, the US government forced the cell phone network providers to implement improved location technology. This public regulation boosted the private market for location technology and other branches benefited from this.

The *MobilAlarm* device and service is sought to be introduced into the European market as soon as possible after the completion of the project. It has various unique selling points:

- A two-button emergency call solution that allows to trigger an alarm by just grasping the device and pressing it.
- The location data are transmitted with Attendo's Care Phone Protocol through an open GSM voice channel, not by unreliable SMS as most devices offered by competitors.
- The marketing and deployment concept is based on an empirically evaluated test of the device and service in three countries with more than 100 users.
- The service will be available for people on the move across national borders in every country of the European Union.

Based on these characteristics, *MobilAlarm* will bring more quality of life to numerous people who today feel unsafe while out.